

DESIGN OF THE TREND NETWORK FOR RIVERS AND STREAMS IN THE NATIONAL WATER-QUALITY ASSESMENT (NAWQA) PROGRAM

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Biographical Sketch of Authors

Dave Mueller has worked on the National Synthesis Project for the U.S. Geological Survey's NAWQA Program since 1992. He was recently named interim leader of the group responsible for trend analysis. Bob Gilliom has been a research scientist and program manager with the U.S. Geological Survey for over 20 years, with studies focused on water-quality modeling, statistical analysis methods, and the environmental occurrence and behavior of contaminants, such as selenium and pesticides. Since 1990, He has directed the Pesticide National Synthesis project of the NAWQA Program. Carol Couch is an aquatic ecologist who has worked with the NAWQA Program since 1992. Since 1999, she has directed the NAWQA Ecological Synthesis Project and manages technical support for taxonomic laboratories and biological databases. All three authors were members of the National Implementation Team (NIT), which was responsible for designing the second decade (2002-2011) of NAWQA monitoring.

Abstract

Cycle I of the U.S. Geological Survey's National Water Quality Assessment Program began in 1991 and was recently completed. During Cycle II, which began in 2001, investigations are continuing in 42 large areas (generally river basins), referred to as study units. Three groups of 14 study units each will be intensively studied for three years, with six additional years of low-intensity assessment. One objective of Cycle II is to evaluate trends in the chemical and biological quality of the Nation's rivers and streams and to relate these to probable causes. To achieve this objective, a network of sampling sites was designed to represent:

- The major land uses of the Nation,
- The diversity of hydrologic environments and stream ecosystems, and
- Streams used for drinking-water supply.

This trend network is composed of four types of sampling sites: integrator sites, agricultural indicator sites, urban indicator sites, and reference sites. Site selection was based on different criteria for each type of site. Integrator sites were chosen to represent regional examples of river basins influenced by a typical mix of land uses. Indicator sites, generally located on smaller streams, were selected to represent the Nation's most extensive agricultural settings and the largest and fastest growing urban areas. Reference sites were chosen to provide a comparative basis for evaluating the ecological effects of urban and agricultural land uses. The majority of sites were selected from those that had been routinely sampled during Cycle I, but a few new sites were added to meet the design requirements. The resultant trend network includes 159 sites with mean annual streamflows ranging from less than 10 to more than 40,000 cubic feet per second in watersheds ranging from about 10 to more than 85,000 square miles.